FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Main) Examination, June 2016

Subject : Water and Waste Water Engineering

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 State the significance of protected water supply.   2
2 Define hardness and explain any one simple method for its removal.   2
3 How do you arrive at the total quantity of water to be supplied to a city?   2
4 Define 'flowing through period' and 'detention period' in a sedimentation basin.   3
5 With a sketch, state the functions of catch basins.   3
6 Enumerate the factors governing the quick conveyance of sewage.   2
7 State the advantages and disadvantages of a trickling filter.   3
8 Discuss the tests carried out as chemical analysis of sewage.   3
9 Describe the various methods of disposal of effluent.   2
10 The 5 day BOD of a waste 200 mg/ lt and reaction rate constant = 0.17 d^{-1}. Find the ultimate BOD of the waste.   3

PART – B (5 x 10 = 50 Marks)

11 a) Explain Hardy cross method of solving the network by balancing flows by correcting assumed heads. Derive the expression used.   5
   b) The population of a locality as obtained from census report is as follows :   5

Year	1881	1891	1901	1911	1921	1931	1941
Population	8000	12000	17000	22500	29000	37500	47000

Year	1951	1961
Population	57000	66500

   Estimate the population of the locality in the years 2001, 2021 and 2041 by Incremental increase method.

12 a) Describe in detail the criteria for a good disinfectant, mechanism and methods of disinfection.   5
   b) Find the diameter of the particles with specific gravity 1.2 removed in a tank having a surface area of 300m^2 and treating 10 million litres of water per day. The temperature of water is 21^{0}C.   5

13 a) A concrete sewer pipe 60 cm in diameter is laid at a slope of 1 in 800 using kutter's coefficient and Chezy's formula. Find the velocity and discharge when it is flowing full n = 0.012.   5
   b) Explain briefly the significance of water bodies in disposal of sewage.   5

14 Explain in detail about the activated sludge process along with its advantages, disadvantages and design criteria.   10

15 Design a septic tank in an area having 450 users. Assume necessary data.   10

16 a) Discuss in detail various sources and characteristics of sludge.   5
   b) Explain various design aspects of a sewage treatment facility.   5

17 Write short notes on the following :
   a) Ozone and U-V radiations   4
   b) Infiltration pipes   3
   c) Storm water sewers   3

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FACULTY OF ENGINEERING

B.E. 3/4 (EEE) II-Semester (Main) Examination, June 2016

Subject : Switch Gear and Protection

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Explain primary and backup protection.	3
2	What is IDMT relay?	2
3	Define distance relay and also explain R-X diagram.	2
4	Draw block diagram of microprocessor based relay and mention advantages of using microprocessor based relay.	3
5	Mention different protection schemes for generator protection.	2
6	What do you understand by differential relays?	3
7	Give the classification of circuit breaker based on operating voltages.	3
8	Define RRRV.	2
9	What are the causes of over voltages?	2
10	Explain principle of Arc-quenching.	3

PART – B (50 Marks)

11 a) Explain construction and working principle of induction type directional power relay with neat diagram.   6

b) Determine the time of operation of a 5-ampere, 3-second over current relay having a current setting of 125% and a time setting of 0.6 connected to a supply circuit through a 400 / 5 current transformer, when the circuit carries a fault current of 4000A. Let the operating time for PSM = 8 is 3.5 seconds.   4

12 a) Explain duality between amplitude and phase comparator with neat phosor diagram.   4

b) Draw and explain working principle of
   i) Phase splitting type phase comparator   3
   ii) Rectifier bridge type phase comparator   3

13 a) Discuss protection of transformer against magnetizing in rush current with neat diagram.   5

b) Explain protection of generator against loss of excitation.   5

14 Derive an expression of restriking voltage, RRRV and maximum RRRV.   10

15 a) With the help of neat diagram explain types of lighting arrestors.   6

b) Explain in detail about insulation coordination.   4

16 a) Discuss different over current protection schemes.   4

b) Explain construction and working principle of SF6 circuit breaker with neat diagram.   6

17 Write short notes on :
   a) Testing of circuit breaker   4
   b) Protection of ring mains   3
   c) Tower footing resistance   3

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FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) II-Semester (Main) Examination, June 2016

Subject : Biomedical Instrumentation

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 State the desirable features of display devices for Bio-signal.   3
2 Mention the characteristic of medical instrumentation devices.   2
3 Mention the principle of EMG.   3
4 Define the various heart sounds in a phonocardiogram.   2
5 Draw and briefly explain the phonocardiography.   3
6 State the Doppler principle of blood flow measurement.   2
7 State the principle of generation of X-rays.   3
8 What is the use of fluoroscopy?   3
9 What are the electric hazards during Bio-electric monitoring?   2
10 What is meant by Medical imaging?   2

PART – B (50 Marks)

11 a) Describe the special features of Thermo-sensitive and optical recorder with neat
     diagram.   6
   b) Explain the need for phase detector in LVDT.   4

12 Explain the operating principle with the block diagram of ECG machine. Mention the
   special types of ECG recorders with the suitable diagrams.   10

13 a) Explain clearly the blood flow measurement using the electromagnetic principle. 5
   b) Explain the origin and characteristics of heart sounds.   5

14 a) Write short notes on Absorption photometry.   5
   b) Explain the working of auto-analyzer with neat diagram.   5

15 Describe the electrical factors governing the hospital design.   10

16 a) Distinguish between EEG and ECG. Explain 10-20 electrode system.   5
   b) Explain the techniques for indirect measurement of blood pressure.   5

17 Write short notes on following :   10
   a) EEG
   b) CT scan

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II-Semester (Main) Examination, June 2016

Subject : Electronic Instrumentation

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 What is the significance of "Limiting Error"?

2 A moving coil meter has a uniform scale with 50 divisions and gives FSR of 5 A. The instrument can read up to ¼" of scale division with a fair degree of certainty. Determine the resolution of the instrument in mA.

3 What is a transducer and how are they classified?

4 Why resistance strain gauges used in pairs? And also list out the important precautions to be taken while using metallic wire strain gauges.

5 Define "Sound Pressure Level" and "Sound Power Level".

6 Detail a typical application of a photo voltaic cell.

7 List the advantages of DVMs over analog voltmeters.

8 Distinguish between skin surface electrode and needle electrode.

9 Explain the need for delayed time base oscilloscope.

10 Explain the basic principle of operation of ultrasonic imaging system.

PART – B (5 x 10 = 50 Marks)

11 a) Enumerate the type of errors that are likely to occur in measurement and show how such errors can be minimized and evaluated.
   b) Explain about various quality management standards.

12 a) Describe the different modes of operation of Piezo-electric transducers.
   b) Explain how rate of fluid flow is measured using a hot-wire anemometer.

13 a) What method do you suggest to measure the level of molten metal at temperature of about 1500^0C in a mould. Explain.
   b) Distinguish between humidity and moisture. Explain different methods used for measurement of humidity.

14 a) With a neat sketch, explain the operation of successive approximation type DVM.
   b) Draw the block-diagram of Delayed-time base oscilloscope and explain its operation.

15 a) What are resting and action potentials? Show the wave-form of action potentials and explain various mechanisms.
   b) Compare ultrasonic and magnetic resonance imaging techniques.

16 a) What is a microphone? Explain about the constructional details and principles of operation of different microphones.
   b) Explain with neat diagram and necessary mathematical equations how a capacitance transducer can be used for thickness monitoring device.

17 Write short notes on the following :
   a) Elements of ISO 9001
   b) SCADA

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FACULTY OF ENGINEERING

B.E. 3/4 (M/P) II-Semester (Main) Examination, June 2016

Subject : Refrigeration and Air Conditioning

Time : 3 hours   Max. Marks : 75

Note: **Answer all questions from Part-A. Answer any FIVE questions from Part-B. Missing data, if any may be suitably assumed and state them clearly. Use of tables and psychrometric charts are permitted.**

PART – A (25 Marks)

1   Define Energy Performance Ratio (EPR) and express its relationship with 'COP'.

2   What is an azeotrope refrigerant?

3   What are the advantages of compound compression with intercooler over single stage compression?

4   Define seeback effect and Petlier effect.

5   What is the function of compressor in vapour compression refrigeration system? How this function is achieved in vapour absorption refrigeration system?

6   The humidity ratio of atmospheric air at 28^0c dry bulb temperature and 760 mm of mercury is 0.016 kg/kg of dry air. Determine   i) partial pressure of water vapour   ii) relative humidity

7   State the factors that determine human comfort.

8   Define 'By pass factor of cooling coil' and 'sensible heat factor'.

9   Draw the sketch of a sling psychrometer – Explain its function.

10 Define food preservation and what are the advantages?

PART – B (50 Marks)

11 An aircraft refrigeration plant has to handle a cabin load of 30 tonnes.   The atmospheric temperature is 17^0c. The atmospheric air is compressed to a pressure of 0.95 bar and temperature of 30^0c due to ram action. This air is them further compressed in a compressor to 4.75 bar, cooled in a heat exchange to 67^0c, expanded in a turbine to 1 bar pressure and supplied to the cabin. The air leaves the cabin at a temperature of 27^0c. The isentropic efficiencies of both compressor and turbine are 0.9. Calculate the mass of air circulated per minute and the C.O.P. air Cp = 1.004 KH/kgk and Cp/Cv = 1.4.   10

12 A R-12 refrigerating works on vapor compression cycle. The temperature of the refrigerant in the evaporator is -20^0c. The vapor in dry saturated when it enters the compressor and leaves it in a superheated condition.
The condenser temperature is 30^0c. Assuming specific heat at constant pressure for R-12 in the superheated condition as 1.884 KJ/Kgk, determine. 10

1) Condition of vapor at the entrance to the condenser
2) Condition of vapor at the entrance to the evaporator and
3) Theoretical C.O.P. of the machine

The properties of R-12 are

Temperature ^{0}c	Enthalpy, KJ/kg		Entropy KJ/Kg K	
	Liquid	Vapor	Liquid	Vapor
-20	17.82	178.73	0.0731	0.7087
30	64.59	199.62	0.2400	0.6843

13 a) Explain Lithium bromide refrigeration system with the help of configuration diagram. 6
b) State the principle of steam jet refrigeration. 4

14 The following data is available for the design of air conditioning of a small theatre.

Outdoor design conditions = 30^0c DBT and 70% RH
Comfort conditions required = 22^0c DBT and 50% RH
Total seating capacity = 350 persons
Sensible heat gain per person = 90W
Latent heat gain per person = 30W

Sensible heat due to solar gain and infiltrated air = 46.6 kW
Latent heat gain due to infiltrated air = 23.3 kW
Fresh air supplied = 0.4 m^3 / min / person
Desirable temperature rise in the theatre = 8^0c
Assume that the recirculated air is mixed with the fresh air after the conditioner.
Find a) Room sensible heat factor b) the percentage of total air circulated c) the refrigeration capacity of the conditioner coil.
Assume that the air leaves the conditioner coil with 100% RH. 10

15 a) Draw a neat diagram of air-conditioning system required for summer season. Explain the working of different components in the circuit. 6
b) List the applications of refrigeration in food industry and transport industry. 4

16 Define the following terms : Specific humidity, degree of saturation, relative humidity, absolute humidity and deduce the relevant formulae. 10

17 Draw a neat diagram of three fluid system of refrigeration (Electrolux refrigeration system) and explain its working. 10

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FACULTY OF ENGINEERING

B.E. 3/4 (AE) II – Semester (Main) Examination, June 2016

Subject: Automotive Air–Conditioning

Time: 3 Hours   Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Define (a) relative humidity, (b) specific humidity.   2

2 What are environmental friendly refrigerants?   2

3 Define sensible heat factor.   2

4 Draw skeleton psychrometric chart and indicate various property lines on it.   3

5 Define air-conditioning system. Name basic elements of air-conditioning system.   2

6 Write the chemical formulae for R-113 and R-134a.   3

7 What is hermetically sealed compressor?   3

8 What is the function of receiver-drier in an air-conditioning system?   3

9 What are the advantages of automotive heaters?   3

10 What is the difference between primary and secondary refrigerants?   2

PART – B (50 Marks)

11 Dry air at 25°C DBT and 15°C WBT at 1.01325 bar pressure is used for air conditioning process. Find (1) Relative humidity (2) Humidity ratio (3) DPT (4) Specific enthalpy.   10

12 a) Explain about various types of expansion devices used in air conditioning system.   6
    b) Explain how evaporator temperature is controlled.   4

13 Explain with neat sketches:
    a) Thermostatic expansion valve   5
    b) Ford air-conditioning circuit.   5

14 Discuss in detail with the help of neat labelled diagrams, summer, winter and year round air conditioning systems.   10

15 a) Write the classification and desirable properties of refrigerants.   5
    b) Explain about the ASHRAE coding of refrigerants. Name the refrigerant commonly used in automotive air-conditioner.   5

16 800 m^{3}/min air at 30°C DBT and 10°C DPT is to be mixed adiabatically with 300 m^{3}/min of air at 30°C DBT and 50% RH. For mixed air find (1) Specific humidity (2) DBT (3) WBT (4) Density and (5) Specific enthalpy.   10

17 a) Describe step-wise procedure to calculate load for automobile.   5
    b) Write short notes on cooling load of car.   5

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FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II-Semester (Main) Examination, June 2016

Subject : Web Programming and Services

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 What is URI? Write its format.	2
2 Write Java script function to validate email-id.	3
3 How many servlet config objects are created for a web application?	2
4 What is meant by an enterprise application?	2
5 Distinguish between Servlet and Filter.	3
6 Differentiate JSP include and JSP forward action tags.	3
7 List the protocols used to send a mail using Java Mail API.	2
8 Differentiate between Rowset and Resultset.	3
9 Mention the languages supported by ASP.Net.	3
10 What is CLI?	2

PART – B (50 Marks)

11 a) Create a XHTML registration form to accept the details of a student : Name, Address (Street Name, Country and Pincode), Sex (Male/Femal), Branch (chosen from a list box) and Courses (Check box). Provide submit and reset buttons on it.   6

   b) Write Java script code to validate the form fields username (alphabets only maximum 10 characters), password and retype password (must math with password).   4

12 a) What is a Container? Explain in detail steps involved in deploying a web application.   5

   b) What is session tracking? Write a program to track session using Http session object.   5

13 a) Explain in detail the mechanisms to secure a web application.   5

   b) Write a program to create iterative custom tag using Tag Extension.   5

14 a) Explain different statement objects in JDBC with suitable examples.   5

   b) Write the JDBC program using connection pooling to retrieve the records of an employee from the database based on employee number.   5

15 a) Explain the architecture of CLR.   5

   b) What are the features of ASP.Net? Explain different controls in ASP.Net with examples.   5

16 a) Explain in detail the life cycle methods of a Filter.   5

   b) Write a program to send a mail using Java Mail API.   5

17 Write short notes on the following :   10

   a) **.**Net Remoting

   b) XML parsers

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Main) Examination, June 2016

Subject: Data Warehousing & Data Mining (Elective – I)

Time: 3 Hours   Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1   What is Data Warehoue? What it its use?   2

2   Discuss issues to consider during data integration.   3

3   Define Data Mining.   2

4   What are different types of OLAP servers?   2

5   What are various kinds of Association Rule?   3

6   What is decision tree induction?   2

7   What is prediction? What is Linear Regression?   2

8   What is an outlier analysis? Give one use of it.   3

9   Define precision, recall and F-score.   3

10 What is sequential pattern mining? Give some applications.   3

PART – B (5x10 = 50 Marks)

11 a) Describe KDD process.   5
   b) Explain different methods for data reduction. Give some example.   5

12 a) Explain briefly about the needs of preprocessing the data and also explain different forms of data preprocessing briefly.   5
   b) What are various methods used to handle missing values in data cleaning technique?   5

13 a) What are the different types of Warehouse schemas? Explain.   5
   b) Differentiate between OLTP and OLAP.   5

14 Explain briefly basic algorithm for inducing a decision tree from training sample. Explain tree pruning techniques.   10

15 What is clustering? Describe different methods of clustering in detail.   10

16 a) Explain mining association rules in spatial database.   5
   b) Write about mining on time series database.   5

17 Write short note on: 10
   a) Mining on WWW
   b) Text Mining
   c) Mining Sequence Database.

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Main) Examination, June 2016

Subject: Computer Graphics (Elective – I)

Time: 3 Hours   Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Define Aspect Ratio.	2
2 Define three basic transformations	2
3 Specify open GL API color and control functions	3
4 What is picking?	2
5 Define clipping.	2
6 Write about cubic B-splines	3
7 What is scene graph?	2
8 What is back face detection?	3
9 What is the matrix for perspective projection?	3
10 Classify interactive input devices.	3

PART – B (5x10 = 50 Marks)

11 a) Explain open GL primitives and attributes.
   b) Explain different graphics architectures.

12 a) Find the matrix transformation for scaling the polygon with vertices (1, 3), (2, 7), (5, 5) and (6, 9) to double its size.
   b) How do you animate interactive programs?

13 a) Show that the consecutive rotation operations performed is commutative.
   b) Derive parallel – projection transformation matrix.

14 a) Explain about any line clipping algorithm with an example.
   b) Explain polygonal shading.

15 a) Write about B-spline curves and surfaces.
   b) Explain about hierarchical modeling with structures.

16 a) Explain about three dimensional primitives.
   b) Write about global illumination.

17 Write short notes on:
   a) Programming interface
   b) Curves in open GL
   c) Viewing transformation matrix.

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Main) Examination, June 2016

Subject: Software Testing (Elective – I)

Time: 3 Hours   **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1. Define   3
   a) Failure
   b) Bug
   c) Error
2. What is the role of test plans in V & V diagram?   2
3. Which type of testing is possible with BVA?   3
4. What is the basis of path testing?   3
5. What is the entry and exit criteria for alpha and beta testing?   3
6. What is difference between system test plan and acceptance test plan?   3
7. What is testing defect backlog?   2
8. What is the importance of debugging process?   2
9. What are important features and capability of JMETER?   2
10. List some features of WINRUNNER?   2

PART – B (5x10 = 50 Marks)

11. a) What are factors for determining the limit of testing?   5
    b) Explain about backward and forward traceability.   5

12. a) Explain about state table base testing with example.   5
    b) Write about mutation testing with one example.   5

13. Explain in detail Glib and Humpher's Inspection process.   10

14. Explain the architecture, features and the use of silk test.   10

15. Write about attributes and corresponding metrics in S/W testing.   10

16. a) What are integration testing level of an OOS? Which UML diagrams helpful in testing an OOS?   5
    b) What are the possible type of vulnerabilities in web-based system and how do we handle them in security testing?   5

17. a) Describe steps required for performing debugging process and discuss different types of debugger.   5
    b) Write about TSR methods.   5

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FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Main) Examination, June 2016

Subject: Digital Instrumentation and Control (Elective – I)

Time: 3 Hours   Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 What is a sensor?   2

2 The input to a 10 bit ADC is 2V reference is 5V. What is the binary output?   3

3 Give the basic principle behind RTD   2

4 List the objectives of a control system   3

5 List 5 analog signal conditioning circuits using OP amps   3

6 Define critical frequency with respect to filters   2

7 What is discrete state process? What is discrete state process control system? 3

8 List the controller modes.   2

9 List 2 real time applications of optical sensor.   2

10 Define process lag.   3

PART – B (5x10 = 50 Marks)

11 Explain the operation of OP-amp signal conditioning circuit.   10

12 a) Explain about pressure sensor.   5
   b) Explain the operation of an LVDT.   5

13 a) What is a sample and hold circuit?   5
   b) Explain the operation of a dual slope ADC.   5

14 a) Explain about PLC operation.   5
   b) Explain about ladder diagram elements.   5

15 With a neat diagram explain the operation of stepper motor and its applications in process control system. Give a real life example.   10

16 a) Explain the operation of 2-position control with an example.   5
   b) Discuss different design considerations in Analog controllers.   5

17 Write short notes on the following:
   a) Bridge circuits   4
   b) Strain guage   3
   c) Use of ladder diagrams in elevator control.   3

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